In The Claims:

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A method of bonding and debonding two or more surfaces or supports or layers of an adhesive system, the ~~adhesive system~~ method comprising:

~~(i) an adhesive composition at its bonded surface(s), the composition being placed between said surfaces or supports or layers, and the adhesive composition comprising an adhesive agent and/or a primer and/or a cleaner at its interface and dispersed therein at least two sets of thermoexpandable microspheres that are not simultaneously activatable;~~

~~(ii) a first set of thermoexpandable microspheres being associated with curing and bonding; and~~

~~(iii) a second set of thermoexpandable microspheres being associated with debonding, wherein, in order to debond the system, a sufficient power level of thermal radiation and/or thermal energy is provided which concentrates on the adhesive surfaces so as to expand the second set of thermoexpandable microspheres in the adhesive and/or a primer and/or a cleaner layers and so causes weakening of adhesive surface forces at the interface of said layers in the adhesive system.~~

(i) providing a first power level of thermal radiation and/ or thermal conduction and/or thermal energy which passes through the adhesive composition so the contents of a first set of thermoexpandable microspheres leach or migrate through their porous shells into the matrix of the composition and wherein the first set of thermoexpandable microspheres is associated with curing and bonding; and

(ii) providing a second power level of thermal radiation and/or thermal conduction and/or thermal energy which concentrates on the adhesive surfaces so as to expand a second set of thermoexpandable microspheres in the adhesive and/or cleaner and/or primer layers, thereby weakening the adhesive forces in the interface of the adhesive system.

2. (Currently Amended) [[A]] The method according to claim 1, wherein the second power level of thermal radiation and/ or thermal conduction and/or thermal energy which passes through the adhesive composition causes the contents of the second set of thermoexpandable ~~expanded~~ microspheres to leach or migrate through their porous shells into the matrix of the composition.

3. (Currently Amended) [[A]] The method according to ~~either~~ claim 1, wherein the second set of thermoexpandable microspheres comprises ~~encapsulate~~ a blowing agent which acts as a carrier for the contents of the second set of thermoexpandable microspheres.

4. (Currently Amended) An adhesive composition ~~system~~ comprising an adhesive agent and dispersed therein a first set of thermoexpandable microspheres being associated with curing and bonding and a second set of thermoexpandable microspheres being associated with debonding, wherein the first and second sets of thermoexpandable microspheres are not simultaneously activatable. ~~curing an adhesive composition and/or de-bonding the same adhesive at its bonded surface, the composition being placed between two or more surfaces of supports or layers, and the adhesive composition comprising an adhesive and/or cleaner and/or primer at its interface and dispersed therein thermo-expandable microspheres, the system comprising the steps of:~~

~~(i) activating a method of curing the composition by providing a first power level of thermal radiation and/ or thermal conduction and/or thermal energy which passes through the adhesive composition so the contents of the expanded microspheres leach or migrate through their porous shells into the matrix of the composition and ;~~

~~(ii) de-bonding adhesive interfaces of the same surfaces of supports or layers by providing a second power level of thermal radiation and/ or thermal conduction and/or thermal energy which concentrates on the adhesive surfaces so as to expand the microspheres in the adhesive and/or cleaner and/or primer layers and so cause weakening of adhesive surface forces in the interface of the adhesive composition.~~

5. (Currently Amended) [[A]] The method ~~system~~ according to claim 1 [[4]], wherein step (i) is performed after adhesive composition deposition and step (ii) is performed days, weeks, months or years apart.

6. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the second set of thermoexpandable microspheres comprise a co-polymeric shell which encapsulates an expanding agent and the first set of thermoexpandable microspheres comprise a co-polymeric shell which encapsulates ~~for the debonding microspheres and~~ a curing agent or catalyst mixed with an expanding agent ~~for step the curing microspheres~~.

7. (Currently Amended) [[A]] The method ~~or system~~ according to claim 6, wherein the expanding agents are ~~is~~ selected from the group comprising an expandable gas, a volatile agent, a sublimation agent, water, an agent which attracts water or an explosive agent.

8. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1 [[2]], wherein the microspheres associated with curing and bonding ~~encapsulating the curing agent~~ have a larger cross sectional diameter than those associated with debonding. ~~encapsulating the expanding agent.~~

9. (Currently Amended) [[A]] The method ~~or system~~ according to ~~any of~~ claim 1 [[2]] further comprising a curing activator.

10. (Currently Amended) [[A]] The method ~~or system~~ according to claim 9, wherein the curing activator is activated by an applied thermal energy or by its own energy.

11. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the adhesive is polyurethane or polyvinylchloride or an MS polymer or an epoxy resin.

12. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the microspheres associated with debonding are activated in a temperature range of about 45 to 220 °C ~~for the debonding phase~~.

13. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1 [[2]], wherein the ~~proportion of~~ microspheres associated with curing and bonding ~~encapsulating the curing agent~~ are activated at a different temperature from those used in the debonding phase, the temperature difference being between 20 to 100 °C.

14. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the second set of thermoexpandable microspheres comprises ~~used in debonding~~ microspheres encapsulating an ~~the~~ expanding agent, said microspheres encapsulating the expanding agent comprising ~~comprise~~ about 3-5%, by weight, of ~~in~~ the cleaner and about 5-10%, by weight, of ~~in~~ the primer ~~at the adhesive interface~~.

15. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1 [[2]], wherein the first set of thermoexpandable microspheres comprises microspheres ~~used in curing~~ encapsulating a ~~the~~ curing agent or catalyst, said microspheres encapsulating the curing agent or catalyst constituting ~~comprise~~ about 2-3%, by weight, of the composition.

16. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the thermal radiation and/ or thermal conduction provided to the first and second sets of thermoexpandable microspheres is provided by a means comprising a source of IR or UV electromagnetic radiation, or from a convection oven or from electrical means, a battery or a laser or from an ultrasonic source or from gas or from white light or microwaves or sonic waves.

17. (Currently Amended) [[A]] The method ~~or system~~ according to claim 16, wherein in the instance of using IR radiation it is provided as a wavelength of about 800-1400

nm to 2000-6000 nm and concentrates heating radiation on the first and second sets of thermoexpandable microspheres in order to reach their activation expanding temperature in advance of the adhesive matrix[ ] degradation temperature.

18. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the first and second sets of thermoexpandable microspheres are provided embedded in or coated on to a tape, [[or]] mesh or film, or attached to a wire, [[or]] filament or fiber.

19. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the first and second sets of thermoexpandable microspheres are coated in a black material.

20. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the first and second sets of thermoexpandable microspheres are coated with or encapsulate a monomer and/or with nanoparticles dispersed in the porous initial microsphere shell.

21. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the first and second sets of thermoexpandable microspheres act as a vehicle, [[or]] transporter, [[or]] carrier or barrier or dispersing aid, [[or]] aid to prevent~~ion of~~ the clustering of particles or nanoparticles, or detergent or cleaning agent in a mixture comprising a binder and solvent, the thermoexpandable microspheres either encapsulating a desired agent or being coated ~~with it~~ therewith.

22. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the first and second sets of thermoexpandable microspheres are dispersed in an arrangement of micro-wires so as to form a polygonal arrangement.

23. (Currently Amended) [[A]] The method ~~or system~~ according to claim 22, wherein the micro-wires are about 100-200μ in length.

24. (Currently Amended) [[A]] The method ~~or system~~ according to claim 23, wherein the micro-wires are about 2-20μ in diameter.

25. (Currently Amended) [[A]] The method ~~or system~~ according to claim 22, wherein the composition comprises about 1-10% volume of micro-wires.

26. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the first and second sets of thermoexpandable microspheres are attached to a contact surface of one or more of the components which it is desired to attach and/or separate or on an internal surface of the components or at an interface of the cleaner and/or primer of said components.

27. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the adhesive composition comprising the first and second sets of thermoexpandable microspheres is provided in a continuous or discontinuous predefined or in spots in path or channel or groove or line or concentric circles provided substantially around the periphery of one or both of the contact surfaces of the items which it is desired to attach or detach.

28. (Currently Amended) [[A]] The method ~~or system~~ according to claim 1, wherein the depth and breadth or thickness and wideness of the adhesive composition may be uniform or may vary as required in areas of the surface(s) which need to be attached or detached.

29. (Currently Amended) A method of attaching or bonding two or more surfaces together comprising:

(i) applying an adhesive composition according to claim 4 ~~any preceding claim~~ to

one or more of the contact surfaces of each or all items which is to be bonded together; and

(ii) supplying sufficient thermal radiation and/ or thermal conduction to the composition via contact with one or more of the contact surfaces of each or all items which is to be bonded together so as to cause a proportion of the first set of thermoexpandable microspheres to expand and optionally to further release a curing agent into the composition during the bonding process.

30-31. (Canceled)

32. (Withdrawn) An apparatus for attaching or detaching two or more surfaces that have been bonded together comprising an IR emitting device comprising at least one bulb, at least one lens and at least one reflecting mirror mutually arranged so that heat is directed or focused only at an adhesive interface or a path where the thermoexpandable microspheres are present.

33. (Withdrawn) An apparatus according to claim 32 capable of emitting IR radiation in the range of about 800-1400 nm to 2000-6000 nm.

34. (Withdrawn) An apparatus according to claim 31 that is automated and operably linked to a computer program providing information to device sensors of an adhesive bonding path.

35. (Withdrawn) An apparatus according to claim 32 mounted on a mobile unit so that it is free to follow a predefined adhesive bonding path.

36. (Withdrawn) An apparatus according to claim 35 capable of concentrating an IR beam at certain partial points of the surface which it is desired to bond or de-bond in different steps at command.

37. (Withdrawn) An apparatus according to claim 36 that is pre-programmed to follow a specific bonding path in direction, width and breadth.

38. (Currently Amended) A method of [de-]bonding an adhesive composition, the adhesive composition being present at an interface and being placed between two or more surfaces of vehicle glazing or vehicle panel(s) or part(s), the adhesive composition comprising an adhesive or cleaner and/or primer and thermoexpandable microspheres dispersed therein, the microspheres having a diameter of between 30-50 μm ~~10-50 μm~~ and an activation temperature range of between 50-100 °C ~~110-210 C°~~ and encapsulating at least one curing agent and/or catalyst and/or activator, ~~blowing agent the debonding~~ said bonding being effected by exposing the microspheres to a power level of thermal radiation and/or thermal energy that results in a temperature received by the microspheres in the range of 50-100 °C ~~110-210 C°~~.

39. (Canceled)

40. (Currently Amended) A method of curing an adhesive and de-bonding the same adhesive from automotive glazing, [[or]] panels or parts comprising:

(i) applying an adhesive composition between two or more surfaces of the glazing, panel or part(s), said adhesive ~~a~~ composition comprising an adhesive and thermoexpandable microspheres dispersed therein, said thermoexpandable microspheres comprising a first set of thermoexpandable microspheres having a diameter of between 30-50 μm and an activation temperature range of between 50-100 C° and a second set of thermoexpandable microspheres having a diameter of between 10-50 μm and an activation temperature range of between 110-210 C°, ~~the second set of microspheres being present at an interface of the adhesive or cleaner and/or primer, the composition being placed between two or more surfaces of the glazing or panel or part(s) and:~~

(ii) activating curing of the composition by exposing it to a first power level of thermal radiation and/or thermal energy that results in a temperature received by the thermoexpandable microspheres in the range of 50-100 C°; and

(iii) de-bonding the adhesive system at its interfaces by exposing it to a second ~~first~~ power level of thermal radiation and/or thermal energy that results in a temperature received by the thermoexpandable microspheres in the range of 110-210 C°.

41. (Canceled)

42. (Currently Amended) A method according to claim 40 [[38]] for the removal of vehicle glazing, [[or]] panels or parts in an end of vehicle life process.

43. (Currently Amended) A method of detaching or debonding two or more surfaces that have been bonded together comprising, supplying sufficient thermal radiation and/ or thermal conduction to a surface having coated thereon or attached thereto the composition of claim 4, the thermal energy being supplied to one or more of the contact surfaces of each item which are to be detached/separated so as to cause the second set of thermoexpandable microspheres to increase in volume and to become a pressure activator so as to debond the interfaces of the adhesion system.

44. (New) The method according to claim 1, wherein the first and second sets of thermoexpandable microspheres are dispersed in an arrangement of microwires.

45. (New) The method according to claim 44, wherein the microwires are dispersed so as to create a tangle of electrical conductors.